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A STUDY TO DETERMINE
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THOSE PATIENTS UTILIZING A CENTRALIZED
VERSUS A DECENTRALIZED SYSTEM FOR
SCHEDULING OUTPATIENT APPOINTMENTS

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Submitted to the Faculty of
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In Partial Fulfillment of the
Requirements for the Degree
of
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by
Major Glenn N. Raiha, MSC
October 1985

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I. INTRODUCTION

Background Information

In an era of ever-increasing emphasis on providing efficient ambulatory health care services, it becomes extremely important to establish an effective means by which to schedule patient appointments. Although Army Regulation 40-4 contained references to the use of a Central Appointment System (CAS) as early as 1967, the Department of the Army's search for the optimal appointment system actually began in 1972, when the Office of the Surgeon General (OTSG) directed the Health Care Studies Division, Academy of Health Sciences, to prepare a protocol for studying the advantages and disadvantages of a CAS versus a decentralized system. This project, entitled "A Study of Appointment Scheduling Control for Outpatients," was completed in April, 1972.

The OTSG Health Care Research Advisory Board approved the protocol in July, 1972; however, it directed that the protocol be modified to restrict the effort to determine the most efficient and most effective method of operating a CAS. The change in the protocol was apparently made because the OTSG was experiencing pressure from the Department of the Army to enforce the CAS requirement which had been placed in Army Regulation 40-4 five years earlier.¹

During this same time period, the Comptroller of the Army was conducting a study to analyze the workload of outpatient clinics to determine management practices which might be useful in improving overall efficiency. As a result of a recommendation from this study, the Chief of Staff of the Army directed the OTSG in July, 1972, to notify all hospitals that appointment systems were to be standardized and centralized under the Department of Clinics.²

The Health Care Studies Division completed the CAS study in January, 1973. Since the decision had already been made to designate the CAS as the system of choice, the final study results did not have to defend the superiority of the CAS but simply outlined methods to be used in implementing or upgrading an existing CAS.

In spite of the increased emphasis on the CAS, however, local medical treatment facility commanders were quite resistant to a complete CAS implementation. In May, 1973, and again in August, 1974, Headquarters, Department of the Army published letters instructing hospitals to comply with the published directives concerning the operation of a CAS. In 1975, the Army Audit Agency found that hospitals continued to rely on the previously established decentralized appointment system, which either duplicated or assumed CAS workload. The Health Services Command Inspector General reported that, based on a review of inspection reports, numerous hospitals had clinics which were operating a dual appointment system. Interviews conducted by

inspectors revealed an unwillingness of local commanders and health care providers to accept the concept of a CAS.³

In May, 1977, the OTSG imposed a moratorium on the requirement to implement a complete CAS. In addition, the OTSG allowed the local commanders to determine the most appropriate method of appointment scheduling in order to provide maximum patient accessibility to the appropriate levels of care.

The recent publication of HSC Pamphlet 40-7-1 in April 1984 established the formation of the Patient Appointment System (PAS) which is a combination of centralized and decentralized appointment systems within each treatment facility. Local commanders are now authorized to modify their existing appointment systems to establish a totally centralized or decentralized system or a PAS consisting of a combination of both types of systems.

Development of the Problem

Madigan Army Medical Center (MAMC), located in Tacoma, Washington, adjacent to Fort Lewis, Washington, is a U.S. Army Health Services Command (HSC) medical center. MAMC provides comprehensive inpatient and outpatient services as well as veterinary services, environmental health services, and dental services for all eligible beneficiaries. It also serves as a tertiary care center for the Madigan Army Health Services Region to include all Department of the Army Medical Department activities.

During the first three quarters of Fiscal Year 1985 MAMC operated an average of 378 beds with a daily average bed occupancy of 289. Inpatient admissions averaged 56.6 per day with an average length of stay of 5.1 days and average daily live births of 7.3. Outpatient Services include thirty-seven specialty clinics, seven troop medical clinics, one general outpatient clinic, and one twenty-four hour emergency room. Average daily outpatient clinic visits for the first three quarters of Fiscal Year 1985 were 2714.⁴

In 1967 MAMC first established a central appointment system. Appointments were made manually by the appointment clerks and the information was keypunched on cards and fed into a computer to generate clinic schedules. This system remained in effect, with the addition of a rotary wheel in December, 1975 and an automatic call distribution system in October, 1979. The system was fully automated in May, 1982 utilizing a Burroughs B-1865 computer with cathode ray tube terminals for appointment clerk input. The Burroughs Patient Appointment System was established as a prototype and was to be evaluated during a two-year period to determine if the system was adequate to complete the task of making appointments efficiently. In addition to operating the Patient Appointment System, the B-1865 computer was also used to operate all of the other HSC standard automated systems and the locally established operating systems for MAMC. In June, 1984, due to the lack of adequate computer support by the existing Burroughs computer, the MAMC Commander requested an upgrade of

the Burroughs system through acquisition of a Burroughs B-1955 computer for dedicated use by the Patient Appointment System. The poorly designed software of the Burroughs Patient Appointment System requires a large amount of memory and therefore causes the computer to be tied up processing information for the Patient Appointment System while other systems are not able to be processed. The Burroughs 1955 was received and installed in early July, 1985. The addition of an expanded memory capability by early fall 1985 should provide the PAS with more efficient automation support.

The MAMC PAS has continually been a source of patient complaints. In August 1984 the Health Care Consumer Committee recommended that an ad hoc committee be formed to study the PAS and determine what problems exist which limit patient access and contribute to the numerous formal complaints (approximately twenty - thirty per month) presented to the Patient Representative Officer. This committee was formed in September 1984 and consisted of six members of the MAMC staff. The committee determined that there were three major deterrents to an efficient PAS at MAMC. The issues of communication support, automation support, and personnel staffing were identified as major problem areas of the PAS. A copy of the Memorandum prepared by the committee for the Deputy Commander for Clinical Services can be found at Appendix A.

With the publication of a newly revised HSC Pamphlet 40-7-1 the command group of MAMC is currently evaluating the

alternatives of (1) converting the existing system, which is a combination of centralized and decentralized modes, to a totally centralized or decentralized system or (2) refining the existing system to more adequately meet the patients' needs. In order to adequately assess the patients' needs, research was conducted to determine which mode of appointment system is the most satisfactory to the patient population. Even though consideration will be given to the issues of cost and staff desires for any recommended changes to the existing system, a major decision factor is reducing the number of patient complaints and meeting the needs of the patient population.

Research Question

To determine if there is a significant difference in patients' level of satisfaction for those patients utilizing a centralized versus a decentralized system for scheduling outpatient appointments at Madigan Army Medical Center.

Objectives

The specific objectives of this research were to:

1. Conduct a thorough search of the current literature to gather information which is relevant to the research topic.
2. Develop a suitable questionnaire for use as the survey instrument for the research.
3. Conduct a pretest of the survey instrument to establish the validity of the survey questionnaire.

4. Determine randomly selected patients' levels of satisfaction with the scheduling method for outpatient appointment (either centralized or decentralized) at MAMC, utilizing the validated survey instrument.
5. Analyze the data gathered from the survey questionnaire, using Chi-Square and T-Tests to examine the questionnaire responses, both individually and in the aggregate.
6. Provide information to the Commander on the results of the research in order to allow him to evaluate the current system of making outpatient appointments at MAMC and to initiate changes if indicated.

Criteria

Criteria for the research was:

1. The patients' level of satisfaction with a centralized versus a decentralized appointment system was compared, utilizing a statistical significance level of .05.
2. The practical significance of the results was evaluated utilizing the prescribed standard of Health Services Command for patient satisfaction. This standard requires an eighty percent response of satisfaction in order to denote that a particular issue is a patient satisfier. Response to individual questions on specific aspects of the appointment system as well as the overall opinion score were evaluated utilizing this eighty percent standard. Satisfaction is defined as any value greater than or equal to 0 on a five-point satisfaction scale.

3. A return rate of seventy percent for the in-hospital survey and twenty percent for the mail-out survey was required in order to consider the survey process as valid.⁵

Assumptions

For purposes of this study, it was assumed that:

1. During the time between the patients' interaction with the appointment system and the actual administering of the survey, some loss of recall of information may have occurred.
2. Patients' perceptions of the appointment system may have been biased in that they were based not only on their interaction with the military facility appointment system but also on their immediate and past experiences in health care settings, including civilian facilities.
3. Methods of validation of the survey instrument for this research (use of an expert in survey design, evaluation by a panel of individuals with previous work experience with the MAMC appointment system, and administration of a pretest to a representative sample of the population) were sufficient.

Limitations

This study was constrained by the following factors:

1. Inability of the researcher to be physically present to administer each survey to the patient respondents reduced the number of completed surveys and did not provide the respondents with a source for clarification of questions about the survey.

2. Based on the physical plant layout and the large number of clinics at MAMC, coordination to administer the survey on the same day was not practical.

Literature Review

Scheduling is the determination of when or in what order individual tasks of an already-selected set of jobs are to be performed. It involves allocating available resources to specific jobs at definite points in time or in a definite sequence.

Werner F. O. Daechsel, PhD⁶

The earliest article found relating to appointment systems and scheduling was written in 1952. In their article Welch and Bailey discuss appointment scheduling as related to the issues of punctuality (both for patients and providers) and the time spent by the provider in consultation with each patient. Their final conclusion is that any appointment system should be designed with consideration for each provider's average consultation time and the premise that as a clinic becomes more efficient, the patients and providers will become more punctual.⁷

A review of the recent literature published on the subject of appointment systems reveals a number of articles. These articles deal with several different aspects of appointment systems. The major categories into which these articles can be classified are as follows: (1) failed appointments or no-shows; (2) automation considerations in appointment systems; (3) comparison of centralized and decentralized appointment systems; and (4) advantages of a centralized appointment system. Each of

these major categories will be discussed as they relate to the reviewed literature.

Many authors within the past ten years have addressed the major issue of failed appointments or no-shows. Oppenheim, Bergman, and English have found that the primary reasons for this problem are a lack of communication, the length of appointment interval, the absence of a sense of urgency for keeping the appointment, and the lack of a personal physician.⁸ They found that no-show rates ranged from five to eleven percent in family practice centers, and nineteen to twenty-eight percent in general outpatient clinics.⁹ Mailed reminders were found to be the most cost-effective intervention in four studies.^{10,11,12,13}

Several articles show different approaches to automation which can increase patient and provider satisfaction with appointment systems. Herpok, Hansen, and Ritter discuss the use of the Total Medical Record (TMR) system employed at Duke University Medical Center.¹⁴ This automated system has been designed to provide an autonomous scheduling system which matches patients with health care providers and therefore efficiently allocates scarce resources.¹⁵ The conclusions of the article are that the TMR allows providers control over their individual schedule while allowing patients immediate access with up-to-the-minute information about the complete array of available appointments.¹⁶ A different approach to computerized scheduling is presented by Ratzer, Fletcher, Pollack, and Fletcher in their article about mini-computer supported appointment systems.¹⁷

Their discussion of a mini-computer appointment system addresses the issues of cost reduction the ability to tailor the software to meet the needs of each individual clinic. In a facility which does not have the funds available to purchase a mainframe computer, the use of mini-computers for appointment scheduling may be the best solution.¹⁸ A third automated system discussed in the literature is the Special Computer Applications in Medical Practice (SCAMP)system. Shapiro provides an overview of the SCAMP clinical information system for ambulatory care.¹⁹ The four basic advantages of the SCAMP system are (1) ease of use, (2) comprehensiveness, (3) incorporation of medical knowledge, and (4) ease of modification of system capabilities.²⁰ The SCAMP system is currently in use at the Medical University of South Carolina and both the physician staff and patients are very pleased with the simplicity of the system and the information it provides.²¹

Reisman, Mello da Silva, and Mantell conducted an extensive investigation into the systems and procedures for outpatient flow.²² They address the distinct advantages of both centralized and decentralized appointment systems. In the centralized system (1) calls for appointments are always correctly directed; (2) appointment clerks know the available times for each provider, allowing for easy coordination of multiple appointments; (3) paperwork is kept to a minimum; and (4) economy of scale must result.²³ In the decentralized system, (1) appointments are made for only a few providers, usually in a single specialty; (2) the

orientation period for appointment clerks can be shorter; (3) follow-up appointments can be made immediately; and (4) providers can check and adjust their individual schedules.²⁴ Although this study made specific recommendations, the important conclusion was that for any system to function properly it is imperative that each individual understands how their work affects all the others with which they interact.²⁵

The military, with its orientation to outpatient care, has led the way in establishing centralized appointment systems. Most of these systems have been automated using varying sources of computer support. A study conducted by R. B. Stuart in 1972 evaluated the central appointment systems of four Army hospitals. Stuart's study found that ninety-one percent of the patients believed that the CAS was convenient for them, while sixty-two percent of the staff approved of the CAS operation.²⁶ Ninety-three percent of the patients found the CAS clerks courteous, while only fifty-one percent thought the CAS clerks took a personal interest in them.²⁷ Nearly three-quarters of the patients thought the waiting time in the clinics was reasonable.²⁸ Numerous recommendations were made by Stuart at the completion of his study. His overall conclusion was that in multi-specialty clinics, centralized outpatient appointment systems are generally effective and efficient mechanisms for insuring that the health care provider, the ambulatory patient, and his medical record arrive at the right time for a patient/provider encounter with a minimum of waiting by either party.²⁹

Singer, Rossfeld, and Van Hall conducted a study of a centralized appointment system in a civilian institution, Harbor General Hospital, in 1974. Their findings revealed that the introduction of a centralized appointment system resulted in a number of positive changes in the way the hospital provided care to outpatients by making a modest reduction in average waiting time and no-show rates.³⁰

There is no evidence that any studies have been conducted to compare patients' satisfaction with appointment systems. Stuart's study briefly looked at some patient satisfaction issues, but not in very much depth. Chaffee addressed the patient satisfaction issue in a study conducted in 1981 at Dwight David Eisenhower Army Medical Center; however, no data was collected to compare patients' satisfaction with centralized versus decentralized systems.³¹ There is no evidence of any research to determine if there is a difference in satisfaction level of patients using a centralized appointment system versus patients using a decentralized appointment system. A large Army Medical Center is the ideal setting to conduct this research since outpatient appointments are made using both a centralized and a decentralized appointment system.

Research Methodology

The first step in conducting the research for the specific problem was familiarization with the current outpatient appointment system being utilized at MAMC. This process included

interviewing the Patient Appointment System supervisor and appointment clerks, the Administrative Coordinator for the Deputy Commander for Clinical Services, the Automation Management Officer, and the Deputy Commander for Administration to ascertain how the current system functions and what problems relating to the operation of the system exist.

After completion of the preliminary research of the appointment system, determination of an appropriate sample size was made, utilizing tables taken from Backstrom and Hursh-Cesar and methods recommended by Lazerwitz.^{32,33} Utilizing a ninety-five percent confidence level and accepting a five percent tolerated error, the Backstrom and Hursh-Cesar tables required a minimum sample size of 384. This number is consistent with the Lazerwitz methodology in which the sample size is computed as the reciprocal of k squared, where k is the desired precision level about .5 at a 95% confidence level. Using this method, if a five percentage point maximum confidence interval is desired, sample size was determined to be 400. In order to insure that 400 respondents actually complete the survey, 500 patients were selected, since a return rate greater than seventy percent was anticipated.

Utilizing this sample size of 400 for the two categories of appointment systems (centralized and decentralized) a determination of the proportion of the total sample survey to be completed in each clinic was made. This process was accomplished utilizing the following procedures:

1. A calculation of the average daily clinic visits (ADCV) for those clinics utilizing an appointment system (both centralized and decentralized) was made utilizing historical workload data. Outpatient clinics not utilizing an appointment system, such as Emergency Room, Acute Illness Clinic, and the Troop Medical Clinics were excluded from the calculations.
2. The ADCV for each clinic was then compared with the total ADCV (2016) to establish a percentage of the total for each clinic.
3. The percentage for each clinic was then applied to the total sample size of 500 to establish the number of surveys to be completed in each clinic on the day of the survey. This number was labelled n_c .
4. On the day of the survey the number of patient appointments for that day in each clinic, labelled d_c , was divided by n_c to give a value of k ($d_c/n_c=k$). Every k th patient who arrived for an appointment on the day of the survey was administered a survey. This systematic sampling method has been found to be equivalent to a random sample in cases where the sample frame is not cyclic, and was much easier to implement in the clinic setting than a random number or lottery-type selection.^{34,35} The values for each clinic is presented in Table 1.

TABLE 1
IN-HOSPITAL SURVEY DISTRIBUTION TABLE

CLINIC	AVERAGE DAILY VISITS	% OF TOTAL CLINIC VISITS	# OF SURVEYS REQUIRED	SAMPLING VALUE K FOR SURVEY DIST
Adolescent	40	2.0	10	4
Allergy	63	3.0	16	4
Cardiology	74	4.0	18	4
Dermatology	61	3.0	15	4
Endocrine	36	2.0	9	4
Family Practice	187	9.0	46	4
Gastroenterology	53	3.0	13	4
General Surgery	42	2.0	11	4
Gynecology	149	7.0	37	4
Hematology	19	1.0	5	4
Initial Visit	93	5.0	23	4
Internal Medicine	74	4.0	18	4
Nephrology	24	1.0	6	4
Neurology	35	2.0	9	4
Obstetrics	127	6.0	31	4
Oncology	83	4.0	21	4
Ophthalmology	43	2.0	11	4
Optometry	94	5.0	23	4
Orthopaedics	98	5.0	24	4
Otolaryngology	55	3.0	14	4

Table 1 (Continued)

<u>CLINIC</u>	<u>AVERAGE DAILY VISITS</u>	<u>% OF TOTAL CLINIC VISITS</u>	<u># OF SURVEYS REQUIRED</u>	<u>SAMPLING VALUE K FOR SURVEY DIST</u>
Pediatrics	281	14.0	70	4
Plastic Surgery	26	1.0	6	4
Podiatry	27	1.0	6	4
Pulmonary Disease	46	2.0	11	4
Rheumatology	28	1.0	7	4
Social Work	19	1.0	5	4
Speech/Audiology	23	1.0	6	4
Urology	55	3.0	14	4
Well Child	61	3.0	15	4
TOTALS	2016	100	500	

In determining the required number of mailings for the survey of retirees the Retired Services Officers for Fort Lewis and McChord Air Force Base were contacted and asked to provide a listing of registered retirees in the immediate area of MAMC. Initial queries of the Fort Lewis Retired Services Officer revealed that there were approximately 14,000 Army retirees in the MAMC catchment area.³⁶ The Air Force Retired Services Officer estimated a total of 5,000. A total of 20,700 preprinted mailing labels were received from both the Fort Lewis and McChord Retired Services Offices. Based on the resources available, the

target sample size, and the expected return rate it was determined to utilize every twelfth label which generated a total of 1725 mail-outs.

Prior to initiation of the survey process, the survey instrument was evaluated for validity. The validation process included:

1. Review of the survey by LTC Patricia Basta, Chief, Clinical Nursing Services, Department of Nursing, MAMC. LTC Basta has a PhD in nursing with several years of experience in research design and is the expert for Department of Nursing personnel conducting research at MAMC. After reviewing the survey instruments her only comment was that the survey must be adequately pre-tested to insure question clarity.
2. Review of the survey instrument by a panel of individuals who had previous experience working with the PAS at MAMC. This panel recommended several changes to include (1) reducing the length of the questionnaire and addition of emphasis markings for clarity of directions, (2) changing all references to the "Central Appointment System" to read "Patient Appointment System," and (3) clarifying the question about waiting time to make an appointment. It was also recommended that coordination for the actual survey in the clinics be made with each department's administrative assistant for better control.
3. Administration of a pretest to the patient population to determine if the questions being asked were understandable and could be answered easily. The in-hospital survey pretest was

completed using a random sample of patients in the OB/GYN and Pediatric Clinics. The ARC Volunteer administered the questionnaire to individuals and then interviewed them at the completion of the questionnaire. A similar process was completed for the mail-out survey. This questionnaire was administered to a group of retirees who attended a retiree council meeting. The ARC Volunteer completed this process to include the interview of each respondent after completion of the questionnaire.

4. Evaluation of information received from the pretest to determine if the survey questions were clear and understandable. In addition, review of the open-ended questions were conducted to evaluate the possibility of including additional questions not considered in the initial survey. Subjective information provided by the individual administering the pretest was also considered in evaluation of the structure of the survey instrument.

5. After evaluation of the pretest information it was determined that the survey questionnaire needed to be revised in order to make it more understandable and easier to complete. The questionnaires that were originally designed for the in-hospital and mail-out surveys are presented at Appendix B and C, respectively. The revised questionnaires for the in-hospital and mail-out surveys, based on the pretest, are presented in Appendix D and E, respectively. The major changes made to the in-hospital survey were (1) addition of direction indicators to enhance the instructions for completion; (2) redesign of the introduction

letter, using a different type face to make it easier to read; (3) redesign of question three directing the respondent to a single page instead of three different pages; (4) combining the originally designed question for decentralized appointments and centralized appointments into a single sheet; and (5) elimination of page four in the original questionnaire. This question was combined with question three on the first page. The overall effect of the changes was to reduce the original questionnaire from six pages to four pages and insert more directions and emphasis markings for clarity of instructions. The redesign of the mail-out survey, based on pretest input, was basically the same as the in-hospital survey. The other change made to the mail-out survey was to redesign the questions for individuals not using the outpatient services. Pretest input indicated that the directions on the original questionnaire were potentially confusing. Some of the questions were reworded and numerous directions and emphasis markings were placed on the revised questionnaire. Again, the original survey of seven pages was reduced to five pages and a different type face was utilized to allow for ease of reading by the respondent.

Upon completion of the survey instrument validation the research proposal was presented to the MAMC Institution Review Board for approval to conduct human subject research. Approval was granted in May, 1985.

Administration of the in-hospital survey was completed utilizing a Red Cross volunteer to coordinate completion of

requirements. The mechanism for administering the survey included:

1. Surveys were distributed in each outpatient clinic having an appointment system. Distribution of the individual surveys to patients was determined by the clinic receptionist based on the number of completed surveys required for the sample size and the value of k used for systematic random sampling. All of this information was provided in an instruction sheet given to the receptionist.
2. The completed patient surveys were sealed in an envelope and returned to the receptionist by the respondent. The ARC volunteer was available to assist the clinic receptionist in this process.
3. The completed surveys were picked up by the volunteer and returned to the author for analysis of responses.

The preferred method of conducting the survey would have been to accomplish the task of completing questionnaires in each respective area on one chosen day. Due to the large number of clinics and the physical layout of MAMC, completing the survey in one day was not feasible. Responses may have been biased by the day of survey administration due to the different influences such as weather conditions or day of the week. This relatively minor potential limitation was accepted in order to provide closer supervision of survey administration in each clinic. The entire in-hospital survey took five working days to complete.

The mail-out survey was completed using ARC volunteers. They individually placed a survey questionnaire and a postage

paid, pre-addressed, return envelope in each mailing envelope and selected the appropriate address label provided by the Retired Services offices. Upon receipt of each completed questionnaire the envelopes were opened and the surveys were reviewed for completeness.

Analysis of the data was accomplished by compiling the responses to individual questions. A numerical value from one to five was assigned to each response on the satisfaction scales. In addition, an overall satisfaction score was computed for each respondent by averaging responses for all six questions. Chi-Square and T-Tests were performed to determine if there is a significant difference in the level of satisfaction between patients using a centralized versus a decentralized appointment system. A .05 level of significance was utilized. The direction of results (favoring either type of system) was not hypothesized. In addition, analysis of each individual question relating to the appointment system was conducted to determine the practical significance of each specific issue such as waiting time for an appointment, lag time from making the appointment to actual appointment date, the way the patient was treated by the appointment clerk, information given by the appointment clerk, and the overall opinion of the appointment system.

FOOTNOTES

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II. DISCUSSION

Survey Return Rate

A very important consideration in any survey research is the return rate. In this study the return rate was extremely large in comparison to the expected rates and most of the rates published in the literature on survey research.^{1,2,3,4} As stated in the criteria section, a return rate of seventy percent for the in-hospital survey and twenty percent for the mail-out survey would be required to consider the survey process as valid. A total of 452 of the 500 survey questionnaires for the in-hospital survey were returned for a rate of 90.4 percent. Pre-survey coordination contributed to the large in-hospital survey return rate. Prior to the actual date for the in-hospital survey, personal contact was made with each clinic receptionist in those clinics designated to participate. A complete explanation of the research project and the survey instrument was presented. A second factor influencing the large return rate was that the actual survey was conducted over a five day period and therefore allowed the researcher and his assistant to be physically present during a portion of the time when the surveys were being completed in each clinic. This allowed the receptionists to ask any questions about passing out the surveys and insured that the surveys were distributed properly and returned by the respondents. Each day at the completion of the survey, the researcher picked up the completed surveys. In those clinics

where all of the required surveys were not returned, the receptionist was asked the reason for surveys non-completion. The majority of reasons related to the issue of insufficient time to dedicate to distribution of surveys. In no instances were the surveys not completed because of patient refusal. Had the receptionists distributed all of their required surveys an even greater return rate would have been anticipated. Table 2 presents the number of surveys completed in each individual clinic.

TABLE 2
FREQUENCY OF SURVEYS COMPLETED IN EACH CLINIC

CLINIC	NUMBER OF SURVEYS COMPLETED	PERCENTAGE OF TOTAL COMPLETED SURVEYS
ADOLESCENT	10	2.2
ALLERGY	11	2.4
CARDIOLOGY	16	3.5
DERMATOLOGY	14	3.1
ENDOCRINE	9	2.0
FAMILY PRACTICE	40	8.8
GASTROENTEROLOGY	12	2.7
GENERAL SURGERY	11	2.4
GYNECOLOGY	20	4.4
HEMATOLOGY	5	1.1
INITIAL VISIT	23	5.1
INTERNAL MEDICINE	17	3.8
NEPHROLOGY	6	1.3

Table 2 (Continued)

CLINIC	NUMBER OF SURVEYS COMPLETED	PERCENTAGE OF TOTAL COMPLETED SURVEYS
NEUROLOGY	8	1.8
OBSTETRICS	27	6.0
ONCOLOGY	20	4.4
OPHTHALMOLOGY	11	2.4
OPTOMETRY	22	4.9
ORTHOPEDICS	24	5.3
OTOLARYNGOLOGY	14	3.1
PEDIATRICS	64	14.2
PLASTIC SURGERY	6	1.3
PODIATRY	6	1.3
PULMONARY DISEASE	11	2.4
RHEUMATOLOGY	7	1.5
SOCIAL WORK	4	0.9
SPEECH AUDIOLOGY	5	1.1
UROLOGY	14	3.1
WELL CHILD	15	3.3
TOTAL	452	100.0

Comparing the frequencies listed in Table 2 with those of Table 1 indicates that six clinics failed to complete only one survey each. Of the remaining clinics the largest incompleteness occurred in the Gynecology Clinic where seventeen surveys were

not completed. When the receptionist of this clinic was asked why surveys were not completed, she stated that during the day of the survey she became very busy and had several of the clinic staff helping her. She failed to instruct these individuals about passing out the survey. A similar situation occurred in the Family Practice Clinic where six surveys were returned without being filled out.

The mail-out survey consisted of 1725 questionnaires. Of this total, eighty-two of the mailings were returned to the surveyor with an insufficient or incorrect address. Assuming that the remaining 1643 surveys were received by the correct individuals, the calculated return rate for the 867 surveys that were received is 52.7 percent. It appears that the large return rate is indicative of the respondents' eagerness to provide information on an issue which is very timely and controversial. In both surveys the fact that the survey introductory letter was signed by the Commander had a positive effect on the return rate. This is exhibited by the fact that a number of surveys were returned with personal notes and letters addressed to Brigadier General Powell. A third reason for the high return is the fact that the pretest process provided the researcher with a survey instrument which was easy to understand and very simple to follow. The use of the Retired Services Offices' reasonably up-to-date mailing lists (to include preprinted labels) also contributed to the increased return rate. Only four percent of the addresses provided were found to be incorrect.

Description of the Sample Population

The sample population for the in-hospital survey was distributed across the four main categories of patient status with a few responses in the Family Member of Deceased Service Member and Other categories. There were a total of four respondents who did not answer the question on status. The frequency of status of respondents is presented in Table 3.

TABLE 3

ELIGIBILITY STATUS OF RESPONDENTS FOR IN-HOSPITAL SURVEY

ELIGIBILITY STATUS	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
ACTIVE DUTY SERVICE MEMBER	84	18.6	18.8	18.8
FAMILY MEMBER ACTIVE DUTY SERVICE MEMBER	147	32.5	32.8	51.6
RETIRED SERVICE MEMBER	96	21.2	21.4	73.0
FAMILY MEMBER RETIRED SERVICE MEMBER	107	23.7	23.9	96.9
FAMILY MEMBER DECEASED SERVICE MEMBER	12	2.7	2.7	99.6
OTHER	2	0.4	0.4	100.0
NO RESPONSE	4	0.9	N/A	N/A
TOTAL	452	100.0	100.0	

In evaluating the amount of time the respondents had used the outpatient clinic services, 53.9 percent of respondents answered that they had used these services for a period of less than three years, and 46.1 percent stated that they had used the

clinic services for a period greater than three years. A total of four individuals did not respond to this question. Table 4 lists response frequencies for the amount of time respondents had used the outpatient services at MAMC.

TABLE 4

AMOUNT OF TIME IN-HOSPITAL SURVEY RESPONDENTS
HAD USED OUTPATIENT SERVICES

TIME USED OUTPATIENT SERVICES	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
LESS THAN 6 MONTHS	72	15.0	16.1	16.1
6-11 MONTHS	63	13.9	14.1	30.2
1-3 YEARS	106	23.5	23.7	53.9
GREATER THAN 3 YEARS	207	45.8	46.1	100.0
NO RESPONSE	4	0.9	N/A	N/A
TOTAL	452	100.0	100.0	

The method used to make the appointment is the most important information received from the respondents. In order to be able to compare satisfaction with different appointment systems, it was necessary to know to which system respondents were referring. Response frequencies related to the method of making the most recent appointment are presented in Table 5.

TABLE 5

METHOD USED TO MAKE APPOINTMENT FOR IN-HOSPITAL SURVEY

METHOD OF MAKING APPOINTMENT	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
CALLED PAS	125	27.7	27.9	27.9
CALLED CLINIC	146	32.3	32.6	60.5
CLINIC IN PERSON	91	20.1	20.3	80.8
WALK-IN	10	2.2	2.2	83.0
POSTCARD MAIL-IN	22	4.9	4.9	94.2
PHYSICIAN MADE APPOINTMENT	28	6.2	6.3	94.9
EMERGENCY ROOM VISIT	3	0.7	0.7	100.0
OTHER METHOD	23	5.1	5.1	100.0
NO RESPONSE	4	0.9	N/A	N/A
TOTAL	452	100.0	100.0	

Approximately twenty-eight percent had made their most recent appointment by calling the PAS, while 52.9 percent had made their appointment through the clinic either by calling or visiting the clinic in person. Various other methods were given by the respondents, to include 4.9 percent who made the appointment by using a mail-in postcard, 6.3 percent who had their appointment made by their physician, and 2.2 percent who were seen on a walk-in basis. A total of four individuals did not respond to this question.

The sample population for the mail-out survey was distributed across three main categories of patient status not

including the two responses in the Other category. Table 6 shows eligibility status frequency for the mail-out survey.

TABLE 6
STATUS OF RESPONDENTS FOR MAIL-OUT SURVEY

<u>ELIGIBILITY STATUS</u>	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
RETIRED SERVICE MEMBER	649	74.9	76.2	76.2
FAMILY MEMBER RETIRED SERVICE MEMBER	113	13.0	13.3	89.5
FAMILY MEMBER DECEASED SERVICE MEMBER	87	10.0	10.2	99.7
OTHER	2	.2	.3	100.0
NO RESPONSE	16	1.9	N/A	N/A
TOTAL	867	100.0	100.0	

Approximately seventy-six percent of the respondents were retired service members, while 23.4 percent were family members of retired or deceased service members. The large proportion of responses of retired service members is due to the fact that all surveys were addressed to the retired service member and not to individual family members. A total of sixteen individuals did not respond to this question.

Responses to the question concerning the amount of time respondents had used the outpatient clinic services at MAMC were distributed among five categories, including a response for those

who had never used the system. Mail-out survey response frequencies for this question are presented in Table 7.

TABLE 7
AMOUNT OF TIME MAIL-OUT SURVEY RESPONDENTS
HAD USED THE OUTPATIENT SERVICES

TIME USED OUTPATIENT SERVICES	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
LESS THAN 6 MONTHS	25	2.9	3.0	3.0
6-11 MONTHS	23	2.7	2.8	5.8
1-3 YEARS	48	5.5	5.7	11.5
GREATER THAN 3 YEARS	574	66.2	68.6	80.1
NEVER USED SYSTEM	166	19.1	19.9	100.0
NO RESPONSE	31	3.6	N/A	
TOTAL	867	100.0	100.0	

Approximately twelve percent had used the system for less than three years, while 68.6 percent had used the system more than three years, and 19.9 percent had never used the system. Thirty-one individuals did not respond to this question. The 166 individuals who had never used the system gave five different reasons for non-use of the outpatient services. Table 8 presents the number of non-users and the reasons for not using the outpatient services at MAMC.

TABLE 8

REASONS FOR NOT USING THE OUTPATIENT SERVICES AT MAMC

REASON	NUMBER	PERCENTAGE
DISTANCE	88	53.0
DISSATISFIED WITH APPOINTMENT SYSTEM	10	6.0
OTHER MEDICAL INSURANCE	23	13.9
NEVER BEEN SICK	25	15.1
OTHER	21	12.0
TOTAL	167	100.0

Over half (fifty-three percent) of these respondents had not used the outpatient services because MAMC was located too far from their home. Only six percent (ten people) stated that their non-use was due to dissatisfaction with the appointment system. Approximately fourteen percent responded that they had medical insurance coverage for outpatient services in the civilian health care community. It is interesting to note that 15.1 percent responded that they had never been sick, therefore not requiring the outpatient services available to them.

In response to the question concerning the method used to make their last appointment, 41.9 percent of the mail-out survey respondents replied that they had called the PAS, while thirty percent made their appointment by calling or visiting the clinic in person. Approximately three percent utilized the mail-in card system and approximately one percent responded to each of the three categories which included walk-in, physician, and emergency

room. The majority of "not applicable" responses were from those individuals who had responded that they had never used the outpatient clinic services at MAMC. Individuals not responding to this question made up 2.7 percent of the sample population. Table 9 shows the frequencies of responses to the question concerning method of making the appointment.

TABLE 9

METHOD USED TO MAKE APPOINTMENT FOR MAIL-OUT SURVEY

METHOD OF MAKING APPOINTMENT	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
CALLED PAS	354	40.8	41.9	41.9
CALLED CLINIC	133	15.3	15.8	57.7
CLINIC IN-PERSON	120	13.8	14.2	71.9
WALK-IN	10	1.2	1.2	73.1
POSTCARD MAIL-IN	24	2.8	2.9	76.0
PHYSICIAN MADE APPOINTMENT	10	1.2	1.2	77.2
EMERGENCY ROOM VISIT	9	1.0	1.0	78.2
OTHER METHOD	13	1.5	1.5	79.7
NOT APPLICABLE	170	19.6	20.3	100.0
NO RESPONSE	24	2.7	N/A	N/A
TOTAL	867	100.0	100.0	

General Satisfaction Levels

Analysis of the responses to the seven questions concerning satisfaction with specific areas of the appointment system

provides some insight into the satisfaction levels of the in-hospital and mail-out survey groups. The specific areas addressed include: (1) the amount of time it takes to make an appointment, (2) the way the respondent was treated by the appointment clerk, (3) the time and date of the appointment, (4) the amount of time between making the appointment and the actual appointment date, (5) the information provided by the appointment clerk, (6) the respondents' overall opinion of the appointment system, and (7) comments on how to change the existing appointment system. Each of these areas will be analyzed comparing responses of the in-hospital and mail-out groups. Overall satisfaction percentages are calculated by combining the "satisfied" and "very satisfied" responses. Combining the "very dissatisfied" and "dissatisfied" response percentages gives an overall dissatisfaction indicator.

In-hospital and mail-out group responses to the question concerning the amount of time it takes to make an appointment differed. Table 10 presents the response frequencies for the time to make the appointment question.

TABLE 10

LEVEL OF SATISFACTION WITH THE AMOUNT OF TIME
IT TAKES TO MAKE AN APPOINTMENT

LEVEL OF SATISFACTION	ABSOLUTE FREQ	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
VERY DISSATISFIED			
In-Hospital	19	4.8	4.8
Mail-Out	77	12.1	12.1
DISSATISFIED			
In Hospital	29	7.3	12.1
Mail-Out	100	15.7	27.8
NEITHER			
In-Hospital	28	7.0	19.1
Mail-Out	60	9.4	37.2
SATISFIED			
In-Hospital	135	33.9	53.0
Mail-Out	201	31.6	68.8
VERY SATISFIED			
In-Hospital	187	47.0	100.0
Mail-Out	199	31.2	100.0
OVERALL SATISFACTION PERCENTAGE			
In-Hospital --	80.9		
Mail-Out --	62.8		

Almost twenty-eight percent of the mail-out group were dissatisfied. In comparison, only 12.1 percent of the in-hospital group were dissatisfied. Approximately one-third of both groups' responses were "satisfied" but the in-hospital groups' response of "very satisfied" exceeded that of the

mail-out group by 15.8 percent. Overall, 80.9 percent of the in-hospital group and 62.8 percent of the mail-out group were satisfied.

Approximately five percent of the mail-out group and two percent of the in-hospital group were dissatisfied with the treatment provided by the appointment clerk. Although both groups were highly satisfied, the in-hospital group again showed higher satisfaction levels. The overall satisfaction percentages for the in-hospital and mail-out group were 93.9 and 88.0 percent respectively. Response frequencies for the question concerning treatment by the appointment clerk are presented at Table 11.

TABLE 11
LEVEL OF SATISFACTION WITH TREATMENT BY APPOINTMENT CLERK

<u>LEVEL OF SATISFACTION</u>	<u>ABSOLUTE FREQ</u>	<u>ADJUSTED FREQ (PCT)</u>	<u>CUM FREQ (PCT)</u>
VERY DISSATISFIED			
In-Hospital	1	0.3	0.3
Mail-Out	9	1.4	1.4
DISSATISFIED			
In-Hospital	7	1.8	2.1
Mail-Out	20	3.1	4.5
NEITHER			
In-Hospital	16	4.0	6.1
Mail-Out	47	7.4	11.9
SATISFIED			
In-Hospital	97	24.4	30.5
Mail-Out	229	36.0	47.9

Table 11 (Continued)

LEVEL OF SATISFACTION	ABSOLUTE FREQ	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
VERY SATISFIED			
In-Hospital	276	69.5	100.0
Mail-Out	331	52.1	100.0
OVERALL SATISFACTION PERCENTAGE			
In-Hospital	93.9		
Mail-Out	88.0		

The question concerning satisfaction with the time and date of the appointment showed a considerable difference of opinion between the two groups. A comparison of response frequencies is presented in Table 12.

TABLE 12

**LEVEL OF SATISFACTION WITH THE
ACTUAL TIME AND DATE OF APPOINTMENT**

LEVEL OF SATISFACTION	ABSOLUTE FREQ	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
VERY DISSATISFIED			
In-Hospital	8	2.0	2.0
Mail-Out	54	8.5	8.5
DISSATISFIED			
In-Hospital	28	7.1	9.1
Mail-Out	89	13.9	22.4
NEITHER			
In-Hospital	25	6.3	15.4
Mail-Out	69	10.8	33.2

Table 12 (Continued)

LEVEL OF SATISFACTION	ABSOLUTE FREQ	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
SATISFIED			
In-Hospital	133	33.5	48.0
Mail-Out	221	34.6	67.8
VERY SATISFIED			
In-Hospital	203	51.1	100.0
Mail-Out	206	32.2	100.0
OVERALL SATISFACTION PERCENTAGE			
In-Hospital	84.6		
Mail-Out	66.8		

Approximately twenty-two percent of the mail-out group were dissatisfied with this aspect of the system compared with only 9.1 percent of the in-hospital respondents. Comparing the "satisfied" responses of the two groups indicates little difference, while almost nineteen percent more of the in-hospital group gave a "very satisfied" response. Overall, 84.6 percent of the in-hospital group were satisfied with this area, while 66.8 percent of the mail-out group expressed satisfaction.

The in-hospital group was more satisfied with the amount of time between making the appointment and the actual appointment date. Nearly one quarter of the mail-out group expressed dissatisfaction compared to 7.8 percent of the in-hospital group. Again the "satisfied" responses of the two groups consisted of approximately one-third of the total responses. The major

difference between the two groups was in the "very satisfied" category with the in-hospital group exceeding the mail-out group by 21.4 percent. This difference contributed to the variation between the in-hospital groups' 84.2 percent overall satisfaction and the mail-out groups' 63.3 percent overall satisfaction.

Table 13 presents the response frequencies for the amount of time between making the appointment and the actual appointment date question.

TABLE 13

LEVEL OF SATISFACTION WITH THE AMOUNT OF TIME
BETWEEN MAKING THE APPOINTMENT
AND THE ACTUAL DATE OF THE APPOINTMENT

LEVEL OF SATISFACTION	ABSOLUTE FREQ	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
VERY DISSATISFIED			
In-hospital	10	2.5	2.5
Mail-Out	61	9.7	9.7
DISSATISFIED			
In-Hospital	21	5.3	7.8
Mail-Out	92	14.6	24.3
NEITHER			
In-Hospital	32	8.1	15.9
Mail-Out	79	12.5	36.8
SATISFIED			
In-Hospital	140	35.3	51.2
Mail-Out	226	35.8	72.6
VERY SATISFIED			
In-Hospital	194	48.8	100.0
Mail-Out	174	27.4	100.0

Table 13 (Continued)

OVERALL SATISFACTION PERCENTAGE

In-Hospital	84.2
Mail-Out	63.3

Both groups were generally satisfied with the information provided by the appointment clerk. A comparison of the response frequencies for the question concerning information provided by the appointment clerk is presented in Table 14.

TABLE 14

LEVEL OF SATISFACTION WITH THE INFORMATION PROVIDED BY THE APPOINTMENT CLERK

LEVEL OF SATISFACTION	ABSOLUTE FREQ	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
VERY DISSATISFIED			
In-Hospital	4	1.0	1.0
Mail-Out	15	2.4	2.4
DISSATISFIED			
In-Hospital	5	1.3	2.3
Mail-Out	23	3.6	6.0
NEITHER			
In-Hospital	28	7.1	9.4
Mail-Out	50	7.9	13.9
SATISFIED			
In-Hospital	126	32.1	41.5
Mail-Out	275	43.5	57.4
VERY SATISFIED			
In-Hospital	230	58.5	100.0
Mail-Out	269	42.6	100.0

Table 14 (Continued)

OVERALL SATISFACTION PERCENTAGE

In-Hospital	90.6
Mail-Out	86.1

Only six percent of the mail-out group and 2.3 percent of the in-hospital group expressed dissatisfaction with the information provided by the appointment clerk. The overall satisfaction percentages were 90.6 for the in-hospital group and 86.1 for the mail-out group.

The pattern of greater satisfaction for the in-hospital group is repeated for overall opinion of the appointment system. Approximately one-fourth (24.7 percent) of the mail-out group expressed dissatisfaction when asked to give their overall opinion of the appointment system. The in-hospital group responses of "very satisfied" exceeded the mail-out group in the same category by 16.2 percent. Overall satisfaction was reported by 79.5 percent of the in-hospital group and 61.9 percent of the mail-out group. In both groups these overall satisfaction percentages were lower than the satisfaction percentages for each of the other five questions. Table 15 provides the response frequencies for the overall opinion question.

TABLE 15

OVERALL OPINION OF THE APPOINTMENT SYSTEM
USED BY THE RESPONDENT

OVERALL OPINION	ABSOLUTE FREQ	ADJUSTED FREQ (PCT)	CUM REQ (PCT)
VERY DISSATISFIED			
In-Hospital	11	2.8	2.8
Mail-Out	65	10.3	10.3
DISSATISFIED			
In-Hospital	30	7.6	10.4
Mail-Out	91	14.4	24.7
NEITHER			
In-Hospital	40	10.1	20.5
Mail-Out	84	13.3	38.0
SATISFIED			
In-Hospital	135	34.1	54.6
Mail-Out	206	32.7	70.7
VERY SATISFIED			
In-Hospital	180	25.4	100.0
Mail-Out	184	29.2	100.0
OVERALL SATISFACTION PERCENTAGE			
In-Hospital	79.5		
Mail-Out	61.9		

When asked to provide ways to improve the existing appointment system, 38.8 percent of the mail-out group and 16.9 percent of the in-hospital group responded that no changes should be made. Of those individuals who recommended changes to the system, the most frequent response of both groups was to "reduce

the amount of time it takes to make an appointment." The next most frequent response for both groups was "to increase the number of phone lines for making appointments." Approximately four percent of the in-hospital group and eight percent of the mail-out group recommended a complete centralization of the appointment system, while no in-hospital respondents and only 0.6 percent of the mail-out group recommended a total decentralization of the appointment functions. Responses in the "others" category represent general comments and recommendations that did not fit into one of the eight categories. Table 16 presents comments related to improving the current appointment system.

TABLE 16
ADDITIONAL COMMENTS ON HOW TO IMPROVE
CURRENT APPOINTMENT SYSTEM

<u>ADDITIONAL COMMENTS</u>	ABSOLUTE FREQ	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
MORE PHONE LINES			
In-Hospital	18	7.6	7.6
Mail-Out	55	12.2	12.2
MORE APPOINTMENT CLERKS			
In-Hospital	17	7.2	14.8
Mail-Out	41	9.1	21.3
NO LONG DISTANCE HOLD			
In-Hospital	3	1.3	16.1
Mail-Out	19	4.2	25.5

Table 16 (Continued)

ADDITIONAL COMMENTS	ABSOLUTE FREQ	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
LESS CONTACT TIME			
In-Hospital	19	8.0	24.1
Mail-Out	90	20.0	45.5
NO CHANGE			
In-Hospital	92	38.8	62.9
Mail-Out	76	16.9	62.4
MORE DOCTORS			
In-Hospital	2	.8	63.7
Mail-Out	9	2.0	64.4
COMPLETELY CENTRALIZE SYSTEM			
In-Hospital	10	4.2	67.9
Mail-Out	34	7.6	72.0
COMPLETELY DECENTRALIZE SYSTEM			
In-Hospital	0	0	67.9
Mail-Out	3	0.6	72.6
OTHER			
In-Hospital	76	32.1	100.0
Mail-Out	123	27.4	100.0

Based on the previously stated criteria of an eighty percent satisfaction rate in order to determine that a particular area is a patient satisfier, an evaluation can now be made on the six areas. The data presented indicate that the in-hospital group was satisfied with five of the six areas, and that the overall satisfaction percentage of the sixth area (79.5%) was very close

to the stated criteria. The mail-out group, however, expressed overall satisfaction in two of the six areas, both of which dealt with the appointment clerk issues. In order to better understand these differences, further analysis of the data must be accomplished.

Comparing Satisfaction Levels Between Systems

The next logical step in the analysis of the data is to evaluate the patients' satisfaction with the two types of appointment systems. The data from the overall opinion question was analyzed, utilizing Chi-square to determine the significance of the difference between the centralized and decentralized systems. Table 17 presents the overall satisfaction levels selected by users of the centralized and decentralized systems for both in-hospital and mail-out surveys.

TABLE 17

LEVEL OF SATISFACTION FOR PATIENTS USING A
DECENTRALIZED & CENTRALIZED APPOINTMENT SYSTEM

	IN-HOSPITAL		MAIL-OUT	
	ABSOLUTE FREQ	ADJUSTED FREQ (PCT)	ABSOLUTE FREQ	ADJUSTED FREQ (PCT)
VERY DISSATISFIED				
Centralized	8	6.7	42	12.1
Decentralized	1	0.7	9	7.1
DISSATISFIED				
Centralized	15	12.5	57	16.4
Decentralized	5	3.5	17	13.6

Table 17 (Continued)

	IN-HOSPITAL		MAIL-OUT	
	ABSOLUTE FREQ	ADJUSTED FREQ (PCT)	ABSOLUTE FREQ	ADJUSTED FREQ (PCT)
NEITHER				
Centralized	21	17.5	45	12.9
Decentralized	10	7.0	15	11.9
SATISFIED				
Centralized	45	37.5	122	35.1
Decentralized	53	37.3	40	31.7
VERY SATISFIED				
Centralized	31	25.8	82	23.6
Decentralized	73	51.4	45	35.7
Chi-Square	≈ 30.32878		Chi-Square	≈ 8.051786
p	= .000004		p	= .089699

An initial review of the in-hospital results suggests that patients using a decentralized system had a higher overall opinion of the patient appointment system. Over eighty-eight percent of the in-hospital group who used a decentralized system expressed overall satisfaction compared to 63.3 percent of those using the centralized system. "Dissatisfied" or "Very Dissatisfied" responses were given by approximately nineteen percent of individuals using the centralized system, compared to approximately four percent of the decentralized system respondents. The Chi-square value confirms the initial observation that there is a significant difference between the satisfaction responses of the two groups ($p < .001$), although

caution must be exercised in interpreting this finding because one of the cells contains less than five observations.

The mail-out group results appear to reflect the same tendency toward satisfaction with the decentralized system, however, the difference is not as pronounced. Comparing response percentages over the five levels of satisfaction indicates that there is little difference between satisfaction rates of groups using centralized and decentralized systems, with the exception of the "very satisfied" level where the decentralized respondents exceeded the centralized respondents by 12.1 percent. The Chi-square value confirms that there is a trend toward greater satisfaction with the decentralized system ($p < .10$), although this difference does not reach the criterion .05 significance level.

An alternate and more concise method of measuring the difference in patients' satisfaction with the two types of appointment systems is to compare the mean satisfaction scores of each group. Mean scores for each group were computed after assigning a numerical value to each respondent's satisfaction level (5 = Very Satisfied; 1 = Very Dissatisfied). A two-tail t-test was used to compare the responses to the overall opinion question. Table 18 presents the results of this analysis.

TABLE 18
 COMPARISON OF MEAN SATISFACTION SCORES
 FOR OVERALL OPINION OF PATIENTS
 USING A CENTRALIZED & DECENTRALIZED APPOINTMENT SYSTEM

SURVEY GROUP	CENTRALIZED			DECENTRALIZED		
	<u>n</u>	<u>Mean</u>	<u>SD</u>	<u>n</u>	<u>Mean</u>	<u>SD</u>
In-Hospital	120	3.63	1.19	142	4.35	0.82
T-Value -	-5.60			2-Tail Probability -	0.000	
Mail-Out	348	3.42	1.33	126	3.75	1.27
T-Value -	-2.52			2-Tail Probability -	0.012	

The in-hospital mean satisfaction score for those individuals using a centralized system (3.63) was much lower than for those using a decentralized system (4.35). The two-tail t-test with separate variance estimate confirms that there is a significant difference between these two results ($p < .001$). The mail-out group results do not differ as drastically (3.42 compared to 3.75). The two-tail t-test does support that there is a significant difference in satisfaction between individuals utilizing a centralized versus a decentralized system ($p < .05$).

Even though the general opinion question provides a good comparison of satisfaction levels between the two groups, a more thorough analysis of the data is required to understand the reason for the differences in satisfaction. The best way to do this is to analyze responses to each of the questions about

satisfaction with specific aspects of the patient appointment system. Comparisons between respondents using centralized and decentralized systems will be presented for each question, beginning with the area which had the largest difference in mean satisfaction scores. Table 19 shows the comparison of mean satisfaction responses to the question concerning the amount of time it took to actually make the appointment.

TABLE 19

COMPARISON OF MEAN SATISFACTION SCORES
FOR TIME TO MAKE APPOINTMENT FOR PATIENTS
USING A CENTRALIZED & DECENTRALIZED APPOINTMENT SYSTEM

SURVEY GROUP	CENTRALIZED			DECENTRALIZED		
	<u>n</u>	<u>Mean</u>	<u>SD</u>	<u>n</u>	<u>Mean</u>	<u>SD</u>
In-Hospital	122	3.59	1.21	143	4.27	0.97
T-Value -	-5.01			2-Tail Probability -	0.000	
Mail-Out	346	3.29	1.42	128	3.83	1.26
T-Value -	-3.98			2-Tail Probability -	0.000	

The in-hospital portion of the table indicates that individuals using the decentralized system were much more satisfied with the time it took to make an appointment than those individuals using the centralized system. The average decentralized satisfaction level was 4.27, while the centralized mean was 3.59. The two-tail t-test confirms that there is a significant difference between these two groups ($p < .01$). A like comparison of the

mail-out survey responses also indicates a significant difference favoring the decentralized system ($p < .01$).

The next responses to be compared concern the issue of satisfaction with the amount of time between when the respondent made the appointment and the actual appointment date (referred to as lag time). Table 20 presents comparison of the mean satisfaction scores for this question.

TABLE 20

COMPARISON OF MEAN SATISFACTION SCORES
FOR APPOINTMENT LAG TIME FOR PATIENTS
USING A CENTRALIZED & DECENTRALIZED APPOINTMENT SYSTEM

SURVEY GROUP	CENTRALIZED			DECENTRALIZED		
	<u>n</u>	<u>Mean</u>	<u>SD</u>	<u>n</u>	<u>Mean</u>	<u>SD</u>
In-Hospital	123	3.85	1.15	142	4.50	0.74
T-Value -	-5.43			2-Tail Probability -	0.000	
Mail-Out	343	3.50	1.29	128	3.80	1.16
T-Value -	-2.57			2-Tail Probability -	0.011	

Respondents from the in-hospital group utilizing the decentralized appointment system had a mean score of 4.50 compared to 3.85 for those respondents using the centralized system. There appears to be a significant difference in these two groups, which is confirmed by the two-tail t-test ($p < .01$). The mail-out respondents' mean scores do not present as large a difference as the in-hospital group. Those individuals utilizing a decentralized appointment system had a mean score of 3.80

compared to 3.50 for those using the centralized system. The t-test confirms that this difference is significant ($p < .05$).

Another issue which was analyzed was the respondents' satisfaction with the time and date of the appointment they received. Table 21 presents the comparison of the mean satisfaction scores for the question concerning time and date of appointment.

TABLE 21

COMPARISON OF MEAN SATISFACTION SCORES
FOR TIME AND DATE OF APPOINTMENT OF PATIENTS
USING A CENTRALIZED & DECENTRALIZED APPOINTMENT SYSTEM

SURVEY GROUP	CENTRALIZED			DECENTRALIZED		
	<u>n</u>	<u>Mean</u>	<u>SD</u>	<u>n</u>	<u>Mean</u>	<u>SD</u>
In-Hospital	120	3.92	1.16	143	4.43	0.84
T-Value -	-4.02			2-Tail Probability -	0.000	
Mail-Out	347	3.62	1.25	128	3.85	1.29
T-Value -	-1.77			2-Tail Probability -	0.078	

The in-hospital group had a mean score of 3.92 for the centralized system and 4.43 for the decentralized system. The results of the two-tail t-test indicate that there is a significant difference between these two groups ($p < .01$). In comparing the results of the mail-out respondents, the mean scores of the respondents using the centralized and decentralized systems were 3.62 and 3.85, respectively. Even though there is a

difference between these two groups, the t-test results indicate that the significance of this difference is borderline ($p < .10$).

The two questions concerning information provided by the appointment clerk and treatment by the appointment clerk had mean response scores which generally do not appear to be significantly different for the two appointment systems. Tables 22 and 23 present the data for the issues of information provided by the appointment clerk and treatment by the appointment clerk, respectively.

TABLE 22

COMPARISON OF MEAN SATISFACTION SCORES
FOR INFORMATION BY THE APPOINTMENT CLERK FOR PATIENTS
USING A CENTRALIZED & DECENTRALIZED APPOINTMENT SYSTEM

SURVEY GROUP	CENTRALIZED			DECENTRALIZED		
	<u>n</u>	<u>Mean</u>	<u>SD</u>	<u>n</u>	<u>Mean</u>	<u>SD</u>
In-Hospital	121	4.27	0.89	141	4.57	0.60
T-Value -	-3.08			2-Tail Probability -	0.002	
Mail-Out	345	4.23	0.85	127	4.25	0.75
T-Value -	0.25			2-Tail Probability -	0.803	

Satisfaction with information provided by the appointment clerk for the in-hospital group using the centralized system is represented by a mean score of 4.27 compared to a mean score of 4.57 for those using a decentralized system. The t-test confirms that this difference is significant ($p < .01$). The mail-out

groups' response to the same question resulted in a mean score of 4.23 for the centralized system and 4.25 for the decentralized system. This difference was not significant at the .05 level ($p > .10$).

TABLE 23

COMPARISON OF MEAN SATISFACTION SCORES
FOR TREATMENT RECEIVED FROM APPOINTMENT CLERK FOR PATIENTS
USING A CENTRALIZED & DECENTRALIZED APPOINTMENT SYSTEM

SURVEY GROUP	CENTRALIZED			DECENTRALIZED		
	<u>n</u>	<u>Mean</u>	<u>SD</u>	<u>n</u>	<u>Mean</u>	<u>SD</u>
In-Hospital	122	4.60	0.64	143	4.61	0.64
T-Value -	-0.22			2-Tail Probability -	0.829	
Mail-Out	347	4.38	0.77	128	4.33	0.82
T-Value -	0.57			2-Tail Probability -	0.570	

The question concerning the treatment received from the appointment clerk resulted in a mean score of 4.60 for the centralized system respondents and 4.62 for the decentralized system respondents of the in-hospital survey group. The difference between these two groups did not appear to be significant. The results of the t-test confirm that the difference is not significant at the .05 level ($p > .10$). The mail-out groups' response to this question resulted in a mean score of 4.38 for those individuals using the centralized system and 4.34 for the decentralized system respondents. This difference also is not significant at the .05 level.

FOOTNOTES

¹Earl R. Babbie, Survey Research Methods, Belmont, California: Wadsworth, 1983, p. 165.

²Kenneth D. Bailey, Methods of Social Research 2nd ed., New York: The Free Press, 1982, pp. 177-178.

³Floyd J. Fowler, Jr., Survey Research Methods, London: Sage Publications, 1984, p. 55.

⁴Charles H. Backstrom and G. Hursh-Cesar, Survey Research, New York: John Wiley and Sons, 1981, p. 236.

III. CONCLUSIONS AND RECOMMENDATIONS

The specific intent of this research project was to determine if there is a significant difference in patients' level of satisfaction for those patients utilizing a centralized versus a decentralized system for scheduling outpatient appointments at Madigan Army Medical Center. The project focused on measuring patients' satisfaction with five specific areas of the outpatient appointment system. The sample population for this research consisted of two major groups: (1) patients who were using the outpatient appointment system, and (2) retirees who might have used the outpatient appointment system in the past. The large survey return rate indicates that the patient appointment system is a topic of concern for the MAMC patient population.

Findings

This study found that there is a significant difference in patients' level of satisfaction for those patients utilizing a centralized versus a decentralized appointment system. Individuals using the decentralized system were more satisfied with the following: (1) time and date of appointment; (2) time between making the appointment and the actual appointment date; (3) the amount of time it took to make the appointment; and (4) information provided by the appointment clerk. There also was a significant difference in satisfaction for the overall opinion question. Those individuals using a decentralized system had a

more satisfied overall opinion than those individuals using a centralized system. The only items which did not show a significant difference in satisfaction levels for both groups between the two systems were (1) the information provided by the appointment clerk, and (2) the treatment provided by the appointment clerk. A significant difference did exist for satisfaction with the information provided by the appointment clerk within the in-hospital group; but the mail-out group's responses to the same question were not significantly different.

Comparing the responses of patients using a centralized and a decentralized system indicates that the items which were less satisfying were those which related to availability of resources. For both groups the items which caused greater dissatisfaction were the same items which have been addressed by individuals who have previously studied the problems of the MAMC appointment system. The Memorandum for the Deputy Commander for Clinical Services prepared in October, 1984 addresses the three main problems of (1) staffing, (2) communications support, and (3) automation support. The centralized system respondents' greater dissatisfaction with the four areas, including (1) time and date of appointment, (2) amount of time to make the appointment, (3) amount of time between making the appointment and the actual appointment date, and (4) information provided by the appointment clerk, can be attributed to three major resource problems: (1) lack of adequate numbers of appointment clerks, (2) poor communications equipment, and (3) inadequate automation support.

The responses of the decentralized group also indicated that these items were a problem; however, it appears that the magnitude of this problem is less in the decentralized appointment system. The impression that dissatisfaction with the appointment system can be traced to inadequate resources is also supported by the comments presented on how to improve the current appointment system. The four most frequent suggestions for both groups were (1) more phone lines, (2) more appointment clerks, (3) reduce contact time with appointment clerk, and (4) eliminate the practice of putting long distance callers on hold.

Although significant differences were found between centralized and decentralized appointment users in both in-hospital and mail-out surveys, the in-hospital group as a whole tended to be more satisfied. More than eighty percent of the in-hospital survey group expressed satisfaction with five or six areas of the appointment system they used. In the sixth area, overall opinion, 79.5 percent of the in-hospital group expressed satisfaction, which closely approximates the eighty percent HSC criteria. More than eighty percent of the mail-out group expressed satisfaction with only two of the six aspects of the appointment system. These two areas were (1) treatment provided by the appointment clerk, and (2) information provided by the appointment clerk. Approximately sixty percent of the mail-out group expressed satisfaction with the other four areas. It appears that the mail-out group was more dissatisfied than the in-hospital group. This difference between the two groups might

be explained by the in-hospital group being "in-the-system" while the mail-out group was at home, trying to enter the system. Since the mail-out group consisted of retirees, their dissatisfaction with difficulty accessing the system because of their priority in the queue of beneficiaries could have biased their responses to the questions about the appointment system.

Considerations

Several considerations should be addressed before any final recommendations about modifying MAMC's current appointment system can be made. First, consideration should be given to the reliability of the information given by survey respondents. Since all survey participants were asked to base their answers on their most recent outpatient appointment experience, the mail-out group's answers might contain some invalid information. The respondents could have had some recall loss about their last appointment. The in-hospital group's responses should have been fairly accurate since they were physically present in the hospital waiting for the appointment about which they were queried. Also included in this concern is whether or not the patient remembered if they called the PAS or the clinic to make their appointment. It might be possible that some respondents did not know the difference between calling the clinic and calling the PAS.

This research study addressed the issue of patient satisfaction and does not consider the cost factors of operating a

totally centralized or decentralized appointment system. Even though patient satisfaction is an important issue, the resource costs for totally centralizing or decentralizing the appointment system must be a major consideration before any changes are initiated. If the decision is made to totally decentralize the appointment function without further study into the resource allocations necessary to complete such a task, then an under-resourced, decentralized system might cause greater dissatisfaction than the currently established system.

Another consideration is whether or not a decentralized system is better for everyone concerned. This study addresses only patient satisfaction and not the issue of satisfaction of the MAMC staff. Even though this study confirms that patients are more satisfied with a decentralized system, the staff's satisfaction with the appointment system must also be considered before any changes are made. Changing the appointment system at MAMC without staff input could cause staff resentment and resource shortages which would decrease system efficiency.

A major change in the MAMC appointment system may not be necessary to increase patient satisfaction. Minor changes in the current centralized system could be considered in order to improve its image with patients. Further consideration could also be given to improving those areas that are currently "patient dissatisfiers." As previously stated, these areas are resource related. Cost versus benefits of any major changes must be carefully weighed. Any proposal should be carefully

implemented and evaluated for effectiveness, improvement in efficiency, and impact on patient satisfaction.

Recommendations

A total decentralization of the appointment system should not be accomplished based solely on the results of this research. The patients expressed more satisfaction with the decentralized appointment system as it currently exists; however, no additional personnel, phone lines, and automation resources are currently available to totally decentralize the appointment system. If the entire system was decentralized without such additional resources, it would be difficult to meet the appointment requests in each individual clinic. The decentralized mode could become the less favorable method of making appointments.

In light of the findings and considerations previously presented, several recommendations for further study are appropriate. The current appointment system at MAMC must be further analyzed to determine the best method for scheduling appointments. The results of this research should be supplemented by further study to determine the staff's perceptions of the system, the affordability and cost effectiveness of any changes, and the priority of appointment system change in relationship to the other major management and resource problems currently being addressed by the command.

If, after additional research and study, a decision is made to change the existing appointment system, a pilot study should

be conducted to evaluate the resultant changes in patient satisfaction, staff satisfaction, cost effectiveness, and ability to meet the mission of providing quality patient care to beneficiaries. A pilot study would provide an evaluation of the effectiveness of the proposed changes before costly large-scale changes are made.

In a healthcare setting heavily weighted towards ambulatory care, the issue of patient scheduling is extremely important. Appointment systems must be carefully planned and executed in order to maximize efficiency, effectiveness, and patient satisfaction.

APPENDIX A

**MEMORANDUM FOR DEPUTY COMMANDER FOR
CLINICAL SERVICES REFERENCE
PATIENT APPOINTMENT SYSTEM (PAS)**



REPLY TO
ATTENTION OF

HSHJ-CL

DEPARTMENT OF THE ARMY
HEADQUARTERS MADIGAN ARMY MEDICAL CENTER
TACOMA, WASHINGTON 98431

17 October 1984

MEMORANDUM FOR DEPUTY COMMANDER FOR CLINICAL SERVICES, MAMC

SUBJECT: Problems Associated with the Patient Appoint System (PAS) at
Madigan Army Medical Center

1. References:

- a. Ambulatory Patient Care Program Document, Chapter 3E (May 1981).
- b. Ambulatory Patient Care Model #1 (July 1974).
- c. Health Services Command Pamphlet 40-7-1 (Draft) (April 1984).

2. Purpose: To provide information concerning operational difficulties currently being experienced with the Madigan Army Medical Center's Patient Appointment System (PAS) and to identify resource requirements and methodologies that may minimize these difficulties.

3. Discussion: The PAS currently used at MAMC, has been operational since May 1982. It provides support to nineteen distinct clinics. The PAS consists of 1) a computer operated program, maintained on a Burroughs B1865; 2) a staff consisting of one supervisor, one lead appointment clerk, and eight appointment clerks; and 3) a communication system consisting of eight incoming telephone lines which are distributed through the use of an Automatic Call Distributions System (ACDS). The ACDS is capable of "stacking" or holding fifteen incoming telephone calls for this distribution process. Operationally, the ACDS accepts an incoming telephone call, executes a short programmed message, and places or "stacks" the caller on hold for the next available appointment clerk. The appointment clerk answers the telephone, verifies selected patient registration information, and negotiates an appointment for the patient based on patient desires/requirements and practitioner availability. This process requires the computer program to furnish four separate screens of information to the appointment clerk. In addition, appointment clerks also perform secondary roles of dispensing information relating to projected practitioner availability, furnishes procedures the patient must participate in to gain entry to limited specialty services, provides limited information regarding CHAMPUS (referral function), the hours of different clinic operations, accessibility to specific clinic services by patient category, and responses to a multitude of other similar information demands. In selected cases the appointment clerks may provide a screening function in order to direct patients to the correct clinical service. These secondary roles are of significant importance to the facility and the patient caller. However, PAS cannot meet its primary role without the availability of adequate clinic appointments in relationship to patient needs.

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Accordingly, a well equipped, well staffed, and efficiently managed PAS cannot meet all patient requirements at all times unless practitioner availability exceeds patient demand in each clinical service. Recently, the hospital has been the recipient of a significant increase in patient complaints and inquiries relating to limited accessibility to the PAS. This increase correlates with a documented surge in patient demands placed on the eight trunk telephone switches established for PAS by the U.S. Army Communications Command.

Specific difficulties concerning each aspect of the PAS are discussed further under the following issues:

a. Staffing Requirements. In March 1984 a U.S. Army Health Services Command sponsored manpower survey established a recognized personnel requirement for the PAS operation consisting of one supervisor, one lead appointment clerk, and nine appointment clerks. A copy of the survey document is attached (Atch 1). The most significant aspect of this document is that the manpower requirements are based on accomplished workload (patient contacts), without regard to potential patient demand. In response to these requirements, the PAS has an authorized staff of one supervisor, one lead appointment clerk, and eight appointment clerks. One of the appointment clerks has been in a LWOP status since July 1984 awaiting a possible medical retirement determination. Thus, the PAS has a current staff of nine full-time employees. This staffing level is incapable of meeting the demands of the patient population in its present configuration despite exceeding expected individual appointment clerk productivity as established in reference 1b, preceding page. In this regard, patient demand identified by USACC telephonic monitoring instruments indicates incoming telephone inquiries far in excess of PAS capability. These inquiry rates will be further discussed in the communication system portion of this document but at the present time the PAS is able to respond to only one-half of the incoming workload. In addition, support for administrative details such as processing the master schedule, reproduction of schedules, handling patient cancellations, etc., must be taken from manpower resources that should be devoted to receiving incoming telephone contacts.

b. Communications System. There are a few problems associated with this portion of the PAS process. However, these problems are readily identifiable and per conversation with the Commander, U.S. Army Communications Command, will be rectified at the earliest opportunity. The first problem with the system is the limited capability of the recorded patient message. Attempts to extend the capability of the recorded message in terms of length and message changeability have been unsuccessful (Atch 2). This precludes a fully functional instrument that has the potential to respond to patient inquiries, perhaps without the utilization of an appointment clerk. Second, a dedicated line does not exist for the receipt of appointment cancellations on a recorded basis. This lack of capability discourages a patient from calling the PAS to cancel an appointment and produces higher "no show" rates and resultant opportunity costs.

The major impact of the communication system is directed at the total Fort Lewis telephone system. According to the USACC there are 122 telephone lines coming into the Post. Eight of these lines are dedicated to the PAS and 114 lines designated for other post activities. A blocking device exists at the main post

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switch with the function of separating the two systems. Unfortunately, the eight lines for PAS receive telephone calls far in excess of capability. This causes a significant block in the system and, as a result, has tied up telephone switches in the local area. USACC has been informed that as a result of this tie-up the separating device at the main Fort Lewis switch may be removed to increase lines for incoming telephone calls. This action will lessen the impact on local areas but is predicted to block the use of the total post telephone system. The number of incoming calls to PAS cannot be understated. Recent information provided by USACC indicates that PAS has exceeded 40,000 telephone calls in a single 8 hour day. The dramatic increase in telephone calls is reflected, for similar periods, over a twelve month period on the attached report furnished by USACC (Atch 3). Fortunately, these telephone calls do not indicate the number of callers. A survey conducted by the PAS indicates that an average patient makes 16 attempts to contact the PAS before the telephone call is answered. Thus, 40,000 telephone calls represent approximately 2,500 patients. Discounting holdovers that were unable to access PAS on previous days, the total number of callers is estimated at 1500-1600 per day. At the present time the PAS staff is able to respond to 1000 calls per day.

c. Automation Support. The Burroughs B-1865 has a memory capacity of only one megabyte. In relationship to this memory, the PAS must actively compete with other hospital activities such as Personnel Division, Nutrition Care Division, Logistics Division, Patient Administration Division, and the Dept of Nursing for systems access. At the present time, the PAS, as a single entity, utilizes approximately 80-90 percent of all available memory. As a result the system consistently runs out of memory, causing a system shutdown or a delay in response time for the four appointment panels required to consummate each patient appointment. In addition to an insufficient memory capability, the software of the PAS has considerable documented design flaws. The Automation Management Office, Health Services Command, has retained Assigned Responsible Agency (ARA) authority to correct these design flaws based on input from PAS. These design flaws are submitted as Engineering Change Proposals (ECP) for correction. There are two major problems associated with this process. First, there is a significant time lapse for corrective action by HSC. The AMO at HSC has estimated current ECP's will take three man-years by a program analyst to correct. A copy of the outstanding ECP's is attached at Atch 4.

Second, the AMO at HSC is unable to adequately test design flaw packages once they are corrected because the system and patients are located at MAMC. As a result of this system, approximately 30 percent of all supposedly corrected design flaws must be returned to HSC for additional corrective action. Discrepancies in the automation support system have been well documented over the preceding two years. This concern is well expressed in a letter sent to HSC by the Commanding General, MAMC, in June 1984 (Atch 5).

4. Recommended Actions: In response to these difficulties, a number of actions would appear to be appropriate at this time if the PAS is to function in an efficient and effective manner. These recommended actions are detailed in the following categories:

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SUBJECT: Problems Associated with the Patient Appointment System (PAS) at Madigan Army Medical Center

a. Staffing Requirements. It is recommended that the PAS be staffed at 100 percent of its recognized requirements. This will permit full use of the existing terminals in PAS and minimize administrative functions currently being completed by the appointment clerks. In addition, authority should be granted to permit the hiring of four part-time employees to extend PAS operations from 1630 to 2030 hours. This would permit operation of the PAS from 0730-2030 hours each work day. The benefits of this adjustment would be two-fold in that sufficient manpower would be available to handle between 1500-2000 patient inquiries per day and at least four hours of workload would be placed on the computer during periods of least competing interests. Supplemental terminal equipment, additional telephone lines, and other office equipment would not be required to implement this staffing package. It is also recommended that the hiring of part-time employees and expansion of operating hours be enacted on a six month trial basis with a continuance evaluation conducted at the end of the period.

b. Communication System. The efficacy of the communication system is directly related to the staffing computer capability of PAS. Thus, increased staffing and an improved computer system will relieve numerous difficulties with the telephone system. However, it is felt that the expansion of the recorded message capability and a dedicated capacity for patient cancellation calls are imperative as a means of improving the system. In addition, the Commander, USACC, has recommended the conduct of a review and evaluation of the communication system by outside expertise. In this regard, USACC will initiate action to conduct the review and evaluation within the next fourteen days.

c. Automation Support. The present computer system has a significant impact on the difficulties being experienced by PAS. The lack of sufficient computer memory, with its resultant slow-response time and periodic system shutdown, and the hospital's inability to provide speedy on-site corrections of recognized design flaws in the system are a major source of our limited ability to respond to the patient population. Accordingly, the following recommendations should be enacted:

(1) The immediate acquisition and installation of a Burroughs 1955 computer. This computer would provide the PAS sufficient memory for operations and also increase response time and alleviate periodic system shutdowns experienced with the present system. There is a B-1955 available from the Defense Mapping Agency; however, as of this date it has not been identified for transfer to MAMC despite numerous conversations and requests submitted to HSC.

(2) ARA authority should be transferred from HSC to MAMC for the correction of design flaws on-site at the user facility. This transfer of function would permit quicker system correction and an ability to test the system changes prior to implementation. In conjunction with this transfer, the Automation Management Office, MAMC, would require two additional program analysts to correct the existing design flaws.

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5. The three factors that impact on the operation of an efficient and effective PAS have been discussed in detail. These factors are significantly inter-related and must be resolved as a package if the system is to accomplish its primary role of providing clinic appointment periods to the eligible beneficiaries that utilize the facility and its secondary role of service as an information center for our patient population.

5 Atchs

ROBERT F. MURPHY
LTC, MSC
Admin Coordinator
Deputy Commander for Clinical Services
Madigan Army Medical Center

APPENDIX B

IN-HOSPITAL SURVEY PRIOR TO PRETEST

Dear Patient:

A study is being conducted to determine how you feel about the system used for making clinic appointments at Madigan Army Medical Center (MAMC). You are being asked to complete certain portions of the attached questionnaire in order that the system may be more responsive to your needs. Your answer should be based on your experience making the appointment for today's visit and not on any other experiences you have had with other appointment systems. Your answers will be combined with those of other patients and presented anonymously to the MAMC Commander at the completion of the survey.

Please be open and honest about your experiences. This questionnaire cannot be connected with you or your physician since you are not being asked to provide specific information about yourself.

Your cooperation in completing the applicable portions of the questionnaire will be greatly appreciated and will provide valuable information which may be used to make the outpatient appointment system serve you better.

DARRYL H. POWELL M.D.
BG, MC
Commanding

PLEASE TURN TO PAGE 1 AND FOLLOW THE INSTRUCTIONS FOR COMPLETING EACH QUESTION.

1. Please place an X in the box in front of the statement which best describes your current status.

- Active Duty Service Member
- Family Member of Active Duty Service Member
- Retired Service Member
- Family Member of Retired Service Member
- Family Member of Deceased Service Member
- Other

2. How long have you used the outpatient clinic services at MAMC?

- Less than 6 months
- 6 months to 11 months
- 1 to 3 years
- More than 3 years

3. What method best described how you made your appointment for today's visit?

- Called the Central Appointment System. (Please turn to page 2 and answer only those questions on page 2)
- Called this clinic for an appointment. (Please turn to page 3 and answer only those questions on page 3)
- Made appointment in person at this clinic. (Please turn to page 3 and answer only those questions on page 3)
- Appointment was made by another method. (Please turn to page 4 and answer only the questions on page 4)

Appointment Made by Calling Central Appointment System

Please circle the number which best describes your feelings about each of the following issues related to the way in which you made today's appointment. Higher numbers indicate satisfaction and lower numbers indicate dissatisfaction. Please consider only today's experience at MAMC and not any other time or appointment system.

	VERY SATISFIED	NEITHER SATISFIED/ DISSATISFIED	VERY DISSATISFIED
1. The amount of time it took you to make the appt.	5	4	3
2. The way you were treated by the appt clerk.	5	4	3
3. Being able to get your appt at the time and date you desired.	5	4	3
4. The amount of time between when you made the appt and the actual appt date.	5	4	3
5. Information given to you by the appt clerk with regard to the appt.	5	4	3
6. Your overall opinion of the Central Appt System at MAMC.	5	4	3
7. If you can change anything about the Central Appointment System, what would it be?			

PLEASE TURN TO PAGE 5 FOR INSTRUCTIONS ON TURNING IN YOUR SURVEY.

Appointment Made by Contacting Clinic

Please circle the number which best describes your feelings about each of the following issues related to the way in which you made today's appointment. Higher numbers indicate satisfaction and lower numbers indicate dissatisfaction. Please consider only today's experience at MAMC and not any other time or appointment system.

	VERY SATISFIED	NEITHER SATISFIED/ DISSATISFIED	VERY DISSATISFIED
1. The amount of time time it took you to make the appt.	5	4	3
2. The way you were treated by the appt clerk.	5	4	3
3. Being able to get your appt at the time and date you desired.	5	4	3
4. The amount of time between when you made the appt and the actual appt date.	5	4	3
5. Information given to you by the appt clerk with regard to the appt.	5	4	3
6. Your overall opinion of this clinic's appt system.	5	4	3
7. If you can change anything about this clinic's appointment system, what would it be?			

PLEASE TURN TO PAGE 5 FOR INSTRUCTIONS ON TURNING IN YOUR SURVEY.

Other Appointment Systems

If you did not make today's appointment by contacting the Central Appointment System or by contacting the clinic, please describe below how you obtained your appointment.

PLEASE TURN TO PAGE 5 FOR INSTRUCTIONS ON TURNING IN YOUR SURVEY.

Turn in Instructions

Please place your completed survey in the attached envelope, seal it, and return it to the clinic receptionist. The receptionist will not open the envelope and will insure that the survey is returned to the surveyor.

THANK YOU FOR YOUR TIME IN
COMPLETING THIS SURVEY

APPENDIX C

MAIL-OUT SURVEY PRIOR TO PRETEST

Dear Retiree:

A study is being conducted to determine how you feel about the system used for making clinic appointments at Madigan Army Medical Center (MAMC). This study will help to improve the appointment systems at MAMC. You have been selected as part of a systematic sample. Please take the five minutes required to complete this survey. Your answer should be based on your experience making the appointment the last time you visited MAMC and not on any other experiences you have had with other appointment systems. Your answers will be combined with those of others surveyed and presented anonymously to the MAMC Commander at the completion of the survey.

Please be open and honest about your experiences. This questionnaire cannot be connected with you since you are not being asked to provide specific information about yourself.

DARRYL H. POWELL M.D.
BG, MC
Commanding

1. Please place an X in the box in front of the statement which best describes your current status.

- Active Duty Service Member
- Family Member of Active Duty Service Member
- Retired Service Member
- Family Member of Retired Service Member
- Family Member of Deceased Service Member
- Other

2. How long have you used the outpatient clinic services at MAMC?

- Less than 6 months
- 6 months to 11 months
- 1 to 3 years
- More than 3 years
- I have never used the outpatient services at MAMC(PLEASE TURN TO PAGE 5 AND COMPLETE THE QUESTIONS ON THAT PAGE)

3. What method best described how you made your appointment for your most recent visit to MAMC?

- Called the Central Appointment System. (Please turn to page 2 and answer only those questions on page 2)
- Called the respective clinic for an appointment. (Please turn to page 3 and answer only those questions on page 3)
- Made appointment in person at the respective clinic (Please turn to page 3 and answer only those questions on page 3)
- Appointment was made by another method. (Please turn to page 4 and answer only the questions on page 4)

Appointment Made by Calling Central Appointment System

Please circle the number which best describes your feelings about each of the following issues related to the way in which you made your most recent appointment. Higher numbers indicate satisfaction and lower numbers indicate dissatisfaction. Please consider only today's experience at MAMC and not any other time or appointment system.

		NEITHER SATISFIED/ DISSATISFIED	VERY SATISFIED	VERY DISSATISFIED
1. The amount of time it took you to make the appt.	5	4	3	2
2. The way you were treated by the appt clerk.	5	4	3	2
3. Being able to get your appt at the time and date you desired.	5	4	3	2
4. The amount of time between when you made the appt and the actual appt date.	5	4	3	2
5. Information given to you by the appt clerk with regard to the appt.	5	4	3	2
6. Your overall opinion of the Central Appt System at MAMC.	5	4	3	2
7. If you can change anything about the Central Appointment System, what would it be?				

PLEASE TURN TO PAGE 6 FOR INSTRUCTIONS ON TURNING IN YOUR SURVEY.

Appointment Made by Contacting Clinic

Please circle the number which best describes your feelings about each of the following issues related to the way in which you made your most recent appointment. Higher numbers indicate satisfaction and lower numbers indicate dissatisfaction. Please consider only today's experience at MAMC and not any other time or appointment system.

		VERY SATISFIED	NEITHER SATISFIED/ DISSATISFIED	VERY DISSATISFIED	
1. The amount of time time it took you to make the appt.	5	4	3	2	1
2. The way you were treated by the appt clerk.	5	4	3	2	1
3. Being able to get your appt at the time and date you desired.	5	4	3	2	1
4. The amount of time between when you made the appt and the actual appt date.	5	4	3	2	1
5. Information given to you by the appt clerk with regard to the appt.	5	4	3	2	1
6. Your overall opinion of the clinic's appt system.	5	4	3	2	1
7. If you can change anything about this clinic's appointment system, what would it be?					

PLEASE TURN TO PAGE 5 FOR INSTRUCTIONS ON TURNING IN YOUR SURVEY.

Other Appointment Systems

If you did not make your most recent appointment by contacting the Central Appointment System or by contacting the clinic, please describe below how you obtained your appointment.

PLEASE TURN TO PAGE 6 FOR INSTRUCTIONS ON TURNING IN YOUR SURVEY.

Questions for those individuals
not using the outpatient services
at MAMC

1. The reason I do not use the outpatient services at MAMC is:

MAMC is located too far from my home and is very inconvenient to use. (PLEASE SKIP REMAINING QUESTIONS AND GO TO PAGE 6 FOR INSTRUCTIONS)

It is difficult to get an appointment at MAMC. (GO TO QUESTION 2)

Other reason(s) (Please specify your reason(s) in the space below.)

GO TO PAGE 6 FOR INSTRUCTIONS.

2. My dissatisfaction with the appointment system at MAMC is related to the following issues: (PLEASE CHECK ANY OR ALL THE ISSUES THAT APPLY TO YOUR DISSATISFACTION)

The amount of time it takes to make an appointment.

The way I've been treated by the appointment clerk(s).

Not being able to receive the specific appointment date or time I desired.

The amount of time between making the appointment and the actual appointment date.

Information given to me by the appointment clerk with regard to the appointment.

The overall operation of the appointment system at MAMC.

3. If you could change anything about the current appointment system at MAMC what would it be?

PLEASE TURN TO PAGE 6 FOR INSTRUCTIONS.

Turn in Instructions

Please place your completed survey in the attached self addressed envelope and place it in the mail.

THANK YOU FOR YOUR TIME IN
COMPLETING THIS SURVEY

APPENDIX D

IN-HOSPITAL SURVEY AFTER PRETEST

(ACTUAL SURVEY ADMINISTERED)

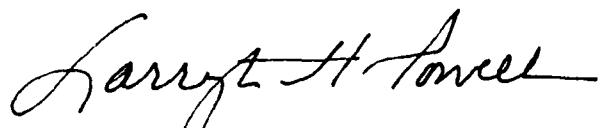
DEAR PATIENT:

A study is being conducted to determine how you feel about the system used for making outpatient appointments at Madigan Army Medical Center (MAMC). You are being asked to complete the attached questionnaire in order that the system may be more responsive to your needs.

Your answers to the questions should be based on your experience making the appointment for TODAY's VISIT and not on any other experience you may have had with the MAMC Appointment System. Your answers will be combined with those of other patients and presented for analysis at the completion of the survey.

Please be open and honest about your experience. Your answers cannot be connected with you or your physician since you are not being asked to provide specific information about yourself.

Your cooperation in completing this questionnaire will be greatly appreciated and will provide valuable information which may be used to make the outpatient appointment system serve you better.



DARRYL H. POWELL
Brigadier General, Medical Corps
Commanding

PLEASE TURN TO THE NEXT PAGE AND FOLLOW THE INSTRUCTIONS FOR COMPLETING THE
QUESTIONNAIRE.



1. PLEASE PLACE AN ''X'' IN THE BOX IN FRONT OF THE STATEMENT WHICH BEST DESCRIBES YOUR CURRENT STATUS:

- Active Duty Service Member
- Family Member of an Active Duty Service Member
- Retired Service Member
- Family Member of a Retired Service Member
- Family Member of a Deceased Service Member
- Other

2. HOW LONG HAVE YOU USED THE OUTPATIENT SERVICES AT MAMC?

- Less than 6 months
- 6 months to 11 months
- 1 to 3 years
- More than 3 years

3. WHAT METHOD BEST DESCRIBES HOW YOU MADE YOUR APPOINTMENT FOR TODAY'S VISIT?

- Called the Patient Appointment System.
- Called this clinic and made the appointment.
- Made the appointment in person at this clinic.
- Made the appointment by another method. PLEASE DESCRIBE HOW YOU MADE THE APPOINTMENT IN THE SPACE BELOW.

*IF YOU CHOSE ONE OF THESE *
ANSWERS GO TO THE NEXT PAGE

AFTER COMPLETING THE DESCRIPTION OF HOW YOU MADE THE APPOINTMENT SKIP THE NEXT PAGE AND TURN TO PAGE 3 FOR FURTHER INSTRUCTIONS. ➔

 *
 *INSTRUCTIONS (PLEASE READ CAREFULLY BEFORE ANSWERING ANY QUESTIONS)
 *

Please circle the number which best describes your feelings about each of the following issues related to the way in which you made TODAY'S APPOINTMENT. Higher numbers indicate satisfaction and lower numbers indicate dissatisfaction. Please consider only TODAY'S APPOINTMENT and not any other time you have made an appointment at MAMC.

	VERY SATISFIED	SATISFIED	NEITHER SATISFIED/ DISSATISFIED	DISSATISFIED	VERY DISSATISFIED
1. The amount of time it took you to make the appointment.	5	4	3	2	1
2. The way you were treated by the appointment clerk.	5	4	3	2	1
3. Being able to get your appointment at the time and date you wanted.	5	4	3	2	1
4. The amount of time between when you made the appointment and the actual appointment date.	5	4	3	2	1
5. Information given to you by the appointment clerk with regard to the appointment.	5	4	3	2	1
6. Your overall opinion of the appointment system you use to make the appointment.	5	4	3	2	1
7. If you could change anything about the appointment system you used to make <u>TODAY'S APPOINTMENT</u> what would it be?					

AFTER COMPLETING THIS PAGE TURN TO THE NEXT PAGE FOR INSTRUCTIONS FOR TURNING IN THE SURVEY.



PLEASE PLACE YOUR COMPLETED SURVEY IN THE ATTACHED ENVELOPE, SEAL IT, AND RETURN IT TO THE CLINIC RECEPTIONIST. THE RECEPTIONIST WILL NOT OPEN THE SEALED ENVELOPE AND WILL INSURE THAT THE SURVEY IS RETURN TO THE SURVEYOR

* THANK YOU VERY MUCH FOR YOUR TIME *
* IN COMPLETING THIS SURVEY *

APPENDIX E
MAIL-OUT SURVEY AFTER PRETEST
(ACTUAL SURVEY ADMINISTERED)

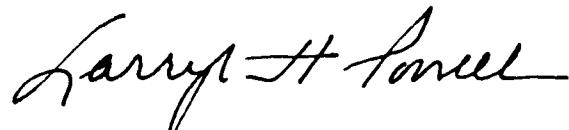
DEAR RETIREE:

A study is being conducted to determine how you feel about the system used for making outpatient appointments at Madigan Army Medical Center (MAMC). You are being asked to complete the attached questionnaire in order that the system may be more responsive to your needs.

Your answers to the questions should be based on your experiences making the appointment for YOUR MOST RECENT VISIT TO MAMC and not on any other ~~ex~~perience you may have had with the MAMC Appointment System. Your answers will be combined with those of other patients and presented for analysis at the completion of the survey.

Please be open and honest about your experience. Your answers cannot be connected with you or your physician since you are not being asked to provide specific information about yourself.

Your cooperation in completing this questionnaire will be greatly appreciated and will provide valuable information which may be used to make the outpatient appointment system serve you better.



DARRYL H. POWELL M.D.
Brigadier General, Medical Corps
Commanding

PLEASE COMPLETE THIS SURVEY AND RETURN IT IN THE ATTACHED SELF-ADDRESSED ENVELOPE NO LATER THAN 20 MAY 1985.

PLEASE TURN TO THE NEXT PAGE AND FOLLOW THE INSTRUCTIONS FOR COMPLETING EACH QUESTION.



1. PLEASE PLACE AN "X" IN THE SPACE IN FRONT OF THE STATEMENT WHICH BEST DESCRIBES YOUR CURRENT STATUS:

- Retired Service Member
- Family Member of a Retired Service Member
- Family Member of a Deceased Service Member
- Other

2. HOW LONG HAVE YOU USED THE OUTPATIENT SERVICES AT MAMC?

- I have never used the Outpatient Services at MAMC.

* IF YOU CHOOSE THIS
* ANSWER-SKIP TO PAGE
* 3 AND ANSWER ONLY THE
* QUESTIONS ON THAT PAGE



- Less than 3 months
- 6 months to 11 months
- 1 to 3 years
- More than 3 years

3. WHAT METHOD BEST DESCRIBES HOW YOU MADE YOUR APPOINTMENT FOR YOUR MOST RECENT VISIT TO MAMC?

- Called the Patient Appointment System

* IF YOU CHOSE ONE OF THESE
* ANSWERS SKIP TO THE NEXT PAGE



- Called the clinic and made the appointment

- Made the appointment in person at the clinic

- Made the appointment by another method.

PLEASE DESCRIBE HOW YOU MADE THE APPOINTMENT IN THE SPACE BELOW

AFTER COMPLETING THE DESCRIPTION OF HOW YOU MADE THE APPOINTMENT SKIP TO PAGE 4 FOR FURTHER INSTRUCTIONS.



 INSTRUCTIONS: (PLEASE READ CAREFULLY BEFORE ANSWERING ANY QUESTIONS ON THIS PAGE)

Please circle the number which best describes your feelings about each of the following issues related to the way in which you made YOUR MOST RECENT APPOINTMENT AT MAMC. Higher numbers indicate satisfaction and lower numbers indicate dissatisfaction. Please consider only YOUR MOST RECENT APPOINTMENT and not any other time you have made an appointment at MAMC.

	VERY SATISFIED	4	NEITHER SATISFIED/ DISSATISFIED	2	VERY DISSATISFIED
1. The amount of time it took you to make the appt.	5	4	3	2	1
2. The way you were treated by the appt. clerk.	5	4	3	2	1
3. Being able to get your appt at the time and date you wanted.	5	4	3	2	1
4. The amount of time between when you made the appt and the actual appt date.	5	4	3	2	1
5. Information given to you by the appt. clerk with regard to the appt.	5	4	3	2	1
6. Your overall opinion of the appt. system you used to make the appt.	5	4	3	2	1
7. If you could change anything about the appointment system you used to make <u>YOUR MOST RECENT APPOINTMENT</u> , what would it be?					

AFTER COMPLETING THIS PAGE TURN TO PAGE 4 FOR INSTRUCTIONS FOR RETURNING YOUR SURVEY.

DO NOT ANSWER THE QUESTIONS ON THIS PAGE UNLESS YOU HAVE NEVER USED THE OUTPATIENT SERVICES AT MAMC.

PLEASE PLACE AN "X" IN THE SPACE IN FRONT OF THE ANSWER WHICH BEST DESCRIBES YOUR OPINION.

1. The reason I do not use the Outpatient Services at MAMC is:

MAMC is located too far from my home and is very inconvenient to use

IF YOU CHOSE THIS ANSWER SKIP THE REMAINING QUESTIONS AND GO TO THE NEXT PAGE



It is difficult to get an appointment at MAMC

IF YOU CHOSE THIS ANSWER PLEASE SKIP TO QUESTION 2

Other reason(s)

IF YOU CHOSE THIS ANSWER PLEASE SPECIFY YOUR REASONS IN THE SPACE BELOW

AFTER SPECIFYING YOUR REASONS GO TO THE NEXT PAGE FOR INSTRUCTIONS. A hand with a pointing index finger, drawn in a simple sketchy style.

2. My dissatisfaction with the appointment system at MAMC is related to the following issues: (PLEASE CHECK ANY OR ALL OF THE ISSUES THAT APPLY TO YOUR DISSATISFACTION)

The amount of time it takes to make an appointment.

The way I have been treated by the appointment clerk(s).

Not being able to get the specific appointment date or time I desired.

Information given to me by the appointment clerk with regard to the appointment.

The amount of time between making the appointment and the actual appointment date.

The overall operation of the appointment system at MAMC.

3. If could change anything about the current appointment system at MAMC, what would it be?

PLEASE TURN TO THE NEXT PAGE FOR INSTRUCTIONS. A hand with a pointing index finger, drawn in a simple sketchy style.

NOW THAT YOU HAVE COMPLETED THE SURVEY, PLEASE FOLD IT AND PLACE IT IN THE SELF-ADDRESSED ENVELOPE AND PLACE IT IN THE MAIL. NO POSTAGE IS REQUIRED FOR MAILING.

THANK YOU VERY MUCH FOR YOUR TIME IN COMPLETING THIS SURVEY!!!!!!

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